December 12, 2003

Wendell Owen, General Manager
Co-Op Mining Company
P.O. Box 1245
Huntington, Utah 84528

Re: Abandoned Equipment, Co-Op Mining Company, Bear Canyon #1 Mine, C/015/0025-03C, Task ID #1696, Outgoing File

Dear Mr. Owen:

The above-referenced amendment has been reviewed. There are deficiencies that must be adequately addressed prior to approval. A copy of our Technical Analysis is enclosed for your information. In order for us to continue to process your application, please respond to these deficiencies by January 12, 2004.

If you have any questions, please call me at (801) 538-5325 or Peter Hess at (435) 613-5622.

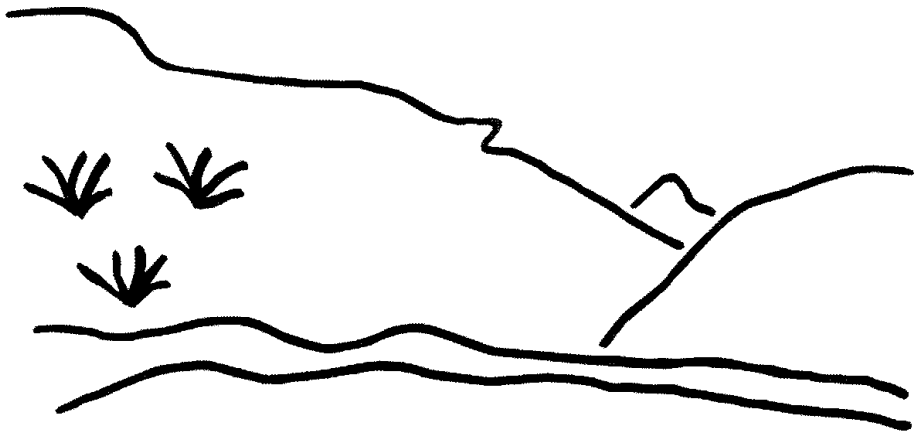
Sincerely,

/S/

Daron R. Haddock
Permit Supervisor

PHH/sd
Enclosure
cc: Price Field Office
O:\015025.BCN\FINAL\DEF1696.DOC

State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Bear Canyon Mine
Abandoned Equipment
C/015/025-03C
Task ID #1696
Technical Analysis
December 11, 2003

TABLE OF CONTENTS

TABLE OF CONTENTS

TECHNICAL ANALYSIS

The Division regulates the Surface Mining Control and Reclamation Act of 1977 (SMCRA). When mines submit a Permit Application Package or an amendment to their Mining and Reclamation Plan, the Division reviews the proposal for conformance to the R645-Coal Mining Rules. This Technical Analysis is such a review. Regardless of these analyses, the permittee must comply with the minimum regulatory requirements as established by SMCRA.

Readers of this document must be aware that the regulatory requirements are included by reference. A complete and current copy of these regulations and a copy of the Technical Analysis and Findings Review Guide can be found at http://ogm.utah.gov/coal

This Technical Analysis (TA) is written as part of the permit review process. It documents the Findings that the Division has made to date regarding the application for a permit and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings which comprise the necessary components of an application. Each section is analyzed and specific findings are then provided which indicate whether or not the application is in compliance with the requirements.

Often the first technical review of an application finds that the application contains some deficiencies. The deficiencies are discussed in the body of the TA and are identified by a regulatory reference which describes the minimum requirements. In this Technical Analysis we have summarized the deficiencies at the beginning of the document to aid in responding to them. Once all of the deficiencies have been adequately addressed, the TA will be considered final for the permitting action.

It may be that not every topic or regulatory requirement is discussed in this version of the TA. Generally only those sections are analyzed that pertain to a particular permitting action. TA's may have been completed previously and the revised information has not altered the original findings. Those sections that are not discussed in this document are generally considered to be in compliance.

INTRODUCTION

The permittee experienced an unanticipated roof fall in the 1st North section of the Bear Canyon #1 Mine (Hiawatha seam) on January 14, 2003 at approximately 6:45 AM. The coal production from the area was being generated via retreat mining (pillar extraction). The roof fall (130 feet in length X 20 feet in width X 20 feet above the coal seam) buried a coal hauler (battery powered), an electrical distribution box, and a shop trailer. After the investigation of the roof fall by the permittee and MSHA, all remaining equipment was removed from the section and the area was sealed with MSHA approved mine seals.

The permittee notified the Division concerning the incident on January 15, 2003 during the initiation of the regular monthly inspection. At that time, the assigned reclamation specialist informed the permittee that it was necessary to submit a permit amendment to document the location of the abandoned machinery such that the Division can make a finding relative to the potential for the degradation of the ground and/ or surface water regimes within the permit area.

The permittee submitted information relative to the roof fall / buried, abandoned equipment on May 29, 2003, and again on November 10.

INTRODUCTION

SUMMARY OF DEFICIENCIES

The Technical analysis of the proposed permit changes cannot be completed at this time. Additional information is requested of the permittee to address deficiencies in the proposal. A summary of deficiencies is provided below. Additional comments and concerns may also be found within the analysis and findings made in this Draft Technical Analysis. Upon finalization of this review, any deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the division, result in denial of the proposed permit changes, or may result in other executive or enforcement action and deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

Regulations

R645-301-728.320, -728.332, -728.350, -731.212, The Permittee needs to describe the water-quality analyses done for the Division of Drinking Water, and report to the Division of Oil, Gas and Mining all water-quality analyses results for the mine-discharge water, including analyses done in compliance with the requirements of the Division of Drinking Water. 14

R645-301-747.300, the permittee must address the notification requirements of the Code of Federal Regulations for batteries of this size. Verification of that notification must be provided to the Division..... 10

SUMMARY OF DEFICIENCIES

OPERATION PLAN

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal Of Noncoal Mine Wastes

The permittee experienced an unanticipated roof fall in the 1st North section of the Bear Canyon #1 Mine (Hiawatha seam) on January 14, 2003 at approximately 6:45 AM. The coal production from the area was being generated via retreat mining (pillar extraction). The roof fall (130 feet in length X 20 feet in width X 20 feet above the coal seam) buried a coal hauler (battery powered), an electrical distribution box, and a shop trailer. After the investigation of the roof fall by the permittee and MSHA, all remaining equipment was removed from the section and the area was sealed with MSHA approved mine seals.

The permittee notified the Division concerning the incident on January 15, 2003 during the initiation of the regular monthly inspection. At that time, the assigned reclamation specialist informed the permittee that it was necessary to submit a permit amendment to document the location of the abandoned machinery such that the Division can make a finding relative to the potential for the degradation of the ground and/ or surface water regimes within the permit area.

The permittee submitted information relative to the roof fall / buried, abandoned equipment on May 29, 2003.

The submittal contains PLATE 7-10B, which is a map of the #1 Mine workings in the Hiawatha seam. PLATE 7-10B locates the area in the 1st North section where the battery powered coal hauler, the electrical distribution box, and the shop car are buried. PLATE 7-10B was P.E. certified by Mr. Charles Reynolds, the permittee's Manager of Engineering Services, on April 24, 2003.

The buried coal hauler contains the following liquids, which could potentially impact ground water emanating in the area; hydraulic oil (55gallons), gear oil (15 gallons), battery electrolyte (28 gallons) and lead in the DC power cells of that machine. The permittee noted these volumes of lubricants and battery electrolyte in the response received by the Division on November 10, 2003, (TASK ID#1696). No volumes of lubricant were indicated as existing on

the shop car. The electrical distribution box will contain quantities of copper, aluminum and other assorted metals, but does not contain any liquids (dielectric substances in capacitors) as indicated by Mr. Charles Reynolds.

Relative to the ground water regime in the 1st North area, PLATE 7-10B depicts a floor seep in the northwest corner of the section generating four gallons of water per minute (SBC-11). A roof dripper located 700 feet west of the buried machinery is noted as generating less than one-tenth of a gallon per minute. A vertical borehole connects the Hiawatha seam with the overlying Blind Canyon seam. A second vertical drill hole reports forty gallons per minute to SBC9. Water is shown to collect in at least two areas of the 1st North section.

The permittee has included text relative to the abandoned equipment portion of the submittal that is included as Appendix 7-P. Page 2 of Appendix 7-P (page 7P-2) indicates that the floor elevation where the equipment is buried is higher than the surrounding area. This is also depicted on page 7P-3, Figure 7P-1. As shown, based on coal seam floor elevations, water accumulating in the Hiawatha seam will drain through Entry 26, preventing the elevation of same in the inby areas (where the equipment has been abandoned) from ever reaching the lubricants, battery electrolyte, or lead containers. "P" traps have been installed in the #1 and #5 seals, (numbered from left to right as if looking toward the northern boundary of the permit area) which will allow ground water to flow from the sealed area toward Entry 26. Thus, the equipment should never intercept the phreatic surface.

PLATE 7-10B depicts two mine water discharge lines emanating from the Hiawatha portal area; a two-inch culinary line and a four-inch mine water discharge line. The route that these lines take once they reach the surface is not known.

The permittee has submitted material safety data sheets for the lubricants (gear oil and hydraulic fluid), the battery electrolyte, and the lead contained in the DC power cells.

No lubricant volumes were reported as existing on the shop car.

No dielectric compounds were reported as being within the electrical distribution box that was abandoned, due to being covered by the roof cave.

Although it appears that ground water will never intercept the chemicals associated with the battery powered coal hauler, the following needs to be noted.

1) The MSDS sheets for the gear oil and hydraulic oil compounds both state the following; "As with any industrial chemical, exposure to the environment should be prevented and minimized wherever possible", and "The degree of biodegradability and persistence of this product has not been determined". Also,

"releases of the product into or leading to surface waters must be reported to the National Response Center at 1-800-424-8802".

2) **The MSDS sheet for the electrolyte filled/lead coal hauler battery(ies) states on Page 3 of that document that both the electrolyte and the lead in the storage cells have an NFPA hazard rating of 3.** Additional information contained in this MSDS sheet states the following; "this product (lead acid battery wet, filled with acid) contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm". Also noted is the following; "EPCRA Section 312 Tier II reporting required for batteries **if sulfuric acid is present in quantities of 500 lbs. or more and/or lead is present in quantities of 10,000 lbs. or more."**

Information gathered from the coal hauler equipment manufacturer revealed the following:

a) Each battery has 64 cells. Each cell contains forty-three pounds of electrolyte (H2SO4). Each cell contains one hundred and thirty-seven pounds of lead.
b) Per battery, the weight of sulfuric acid contained is 64 cells X 43 #'s H2SO4 /cell = 2752 pounds of H2SO4. Times two, (two batteries per coal hauler)=5,504 pounds of H2SO4.
c) Per battery, the amount of lead which was buried with the mining machine equates to 137#/cell X 64 cells = 8768 pounds of lead (Pb). Therefore, with two batteries being buried with the machine, 17,536 pounds of lead have been buried.

The permittee must report this accident to the Environmental Protection Agency in Denver, Colorado to meet the requirements of EPCRA Section 312 Tier II. The permittee must submit a copy of this notification to the Division. In order to inform other government entities of the accident, the following agencies must also be notified:

1) State of Utah, Division of Solid and Hazardous Waste.
2) State of Utah, Department of Environmental Quality, Division of Water Quality.
3) Southeastern Utah District Health Department / Mr. Dave Ariotti.
4) City of Huntington, Utah.
5) Castle Valley Special Service District.
6) USFS / Manti-LaSal National Forest, Price, Utah.

These notification letters must indicate the location of the buried machinery, the types of lubricants and their volumes, the amount of battery electrolyte, and the amount of lead that was buried with the coal hauler.

The permittee must submit copies of the notification letter to the aforementioned agencies to the Division with the next deficiency response. The permittee needs to note in the letter that the ground conditions in the mine were such that the U.S. Department of Labor / Mine Safety and Health Administration would not allow additional coal recovery, or extraction of the buried machinery in that area of the #1 Mine.

Findings:

The submitted information is not adequate. Prior to receiving a recommendation for approval:

R645-301-747.300, the permittee must address the notification requirements of the Code of Federal Regulations for batteries of this size. Verification of that notification must be provided to the Division.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

The section of the mine that was sealed-off included water-monitoring site SBC-11, which monitored floor-seeps in the northeast corner of Mine #1. Drainpipes were placed through seals near SBC-11 and also near the roof fall, at elevations sufficiently low that water should not back-up behind the seals and flood the abandoned equipment. The area where the roof–fall occurred is elevated enough so that seepage can drain around the abandoned equipment by way of surrounding entries and cross-cuts.

Groundwater Monitoring

SBC-9A now monitors flow from the drainpipes that were installed in the seals plus water that comes down from the Blind Canyon Seam through a nearby drill-hole. Co-Op Mining anticipates abandoning SBC-9A and the surrounding entries in 2003 or 2004. Pumping will cease and water will rise until it can drain by gravity into the West Mains, but the abandoned equipment will be above this water level. Water is and will continue to be piped from the West

Mains to the Co-Op water-supply system, and water quality will be monitored for the life of the mine.

The roof-fall has left SBC-11 inaccessible; therefore, SBC-11 has been removed from the Water Monitoring Matrix in Table 7.1-8. Table 7.1-9 (Past and Existing Monitoring Sites) has also been updated to include this information.

Acid- and Toxic-Forming Materials and Underground Development Waste

Potential hydrologic impacts are discussed on pages 7-25 through 7-27 in the MRP. These pages have been updated to include the potential impacts from the abandoned equipment. A separate PHC determination for the Bear Canyon Mine, prepared by Mayo and Associates in 2001 (App 7-J of the MRP), discusses potential impacts from spillage of fuels, greases, and oils during normal operation and maintenance of vehicles and equipment, but does not include consequences from abandoned mining equipment. UDOGM updated the Gentry Mountain CHIA in 2003, but underground abandonment of equipment was not covered in that CHIA.

The roof fall in the 1st North section of the Bear Canyon #1 Mine (January 14, 2003) buried a coal hauler, a distribution box, and a shop trailer, and the buried equipment had to be abandoned in-place. Other equipment was removed and the area sealed.

Steel is the main material in the abandoned equipment, and there are probably small amounts of other common metals. The amount of steel in the mining equipment abandoned at the roof-fall in the #1 Mine is on the order of several tons, but this is not significant considering the amount of steel that is routinely abandoned during underground mining operations over the life of a mine. A considerable tonnage of ferrous materials - such as steel roof bolts, wire mesh, and cans used in support pillars - is left in underground coal mines because these materials cannot be removed without endangering the lives of miners. Based on information from the Genwal Crandall Canyon Mine, room-and-pillar mining requires that approximately 400 tons of steel be placed and abandoned underground for each million tons of coal produced. At the Bear Canyon Mine, coal production has been over 500,000 tons per year since 1996 and was a little over 1 million tons/year in 2000 and 2001: thousands of tons of steel have been left underground since mining began in 1983.

Figure 7P-1 on page 7P-3 shows locations of the abandoned equipment, the main inflows to the mine, the seals and drains, and the anticipated water level when drainage to the West Mains begins. Based on information in the amendment, it is not likely that the areas where the equipment is to be abandoned will be flooded.

Conditions in the abandoned areas of the mine are not conducive to oxidation or other chemical reactions:

- Based on isotopic analyses, water encountered in the mine has had little or no recent communication with the surface and is not subject to annual recharge events.

- Recorded pH values for ground waters entering the Bear Canyon Mine range from 6.6 to 8.3, but are typically neutral to slightly alkaline;

- Oxygen will typically be absent or at low concentration both in the air and waters of the abandoned mine. Other oxidizing agents will typically not be found in an abandoned mine.

- Cool temperatures in the abandoned mine will tend to retard rather than accelerate most chemical reactions.

If the mine were to flood and the abandoned equipment were to be covered with water, several probable results and impacts can be evaluated:

- Flooding of the abandoned mine might be relatively rapid, but once flooded, flow of ground water into, through, and out-of the void spaces of the mine should be slow;

- If steel or other metals oxidize, it would be at a slow rate and the amount of iron and other metals added to the ground water at any one time would be small;

- Oxides of most metals are insoluble or slightly soluble in water (anions in solution in the water could increase solubility, but this is not anticipated based on typical ground-water chemistries of the region), especially at pHs and temperatures expected in the mine, so once formed, metal oxides would tend to precipitate as solids within the mine rather than flow in solution in the ground water. If any metal were to go into solution, concentrations would be highest near the abandoned equipment but increasingly dilute with increasing distance from the abandoned equipment;

- Because of dilution, dispersion, and natural seasonal fluctuations, changes in ground-water quality would probably not be detectable in springs or ground-water baseflow to streams. However, because of the relatively short and direct flowpath from the equipment to the point of mine discharge, contaminants from the equipment might be detectible in the mine discharge, which is used as a culinary water supply.

If the abandoned equipment is not covered with water as the mine floods, which is the expected scenario at Mine #1, components might break down and metals oxidize at a faster rate, but probable impacts would be small because of the isolation and relative immobility of most potential contaminants.

Whether the equipment were flooded or not, more mobile materials such as acids, lubricants, and hydraulic fluids could escape from the equipment and contaminate the hydrologic system. Appendix 7-P contains MSDSs for materials that were left in the abandoned equipment. Potential contaminants from the abandoned equipment are:

15 gallons of R&O 150 in the gear boxes;
50 to 55 gallons of hydraulic fluid
20 to 28 gallons of sulfuric acid in the batteries; and
lead in the batteries.

Water-Quality Standards And Effluent Limitations

The potential of contamination in water discharging from the mine is a special concern at the Bear Canyon Mine because Co-Op Mining Company utilizes the water from the mine for both culinary and mining purposes. Monitoring of the mine discharge will continue for the life of the mine. Potential contaminants from the abandoned equipment are identified in the MRP, and MSDSs are in Appendix 7-P. Water not consumed in culinary and mine operations is discharged to the stream in Bear Canyon under a UPDES permit.

The water-monitoring plan in the MRP calls for quarterly water-quality monitoring at SBC-9A. This should be sufficient to detect a prolonged or significant increase in sulfate concentration caused by acid leaking from the batteries. Water samples collected at site SBC-9A are analyzed for oil and grease, and the UPDES permit requires a determination of oil and grease for water discharged to Bear Creek. Under the water-monitoring plan, analysis is done for lead only once every five years, in the year prior to permit renewal.

Because the mine discharge provides the culinary water supply for the mine, it is also subject to periodic sampling to meet the requirements of the Clean Drinking Water Act. Water analyses required for the Bear Canyon Water System by the Division of Drinking Water are:

Bacteriological	- Quarterly
Lead and Copper	- 5 samples every 3 years (samples must be first draw)
Asbestos	- 1 sample every 9 years
Inorganics and Metals	- 1 sample every 3 years
Nitrate	- 1 sample every year
Nitrite	- 1 sample every year
VOC	- 1 sample every 6 years
Radionuclides	- 1 sample every 4 years.

The Coal Mining Rules require that discharges of water from areas disturbed by coal mining and reclamation operations be made in compliance with all Utah and federal water

quality laws and regulations, and monitoring submittals to the Division are to include analytical results from each sample taken during the reporting period. There is special concern on the part of Division of Oil, Gas and Mining, the Division of Drinking Water, and the Permittee that contaminants from the abandoned equipment be detected should they enter the mine's water system. The results of analyses done to comply with Division of Drinking Water requirements should be reported also to the Division of Oil, Gas and Mining as part of the mine water-monitoring plan.

Findings:

R645-301-728.320, -728.332, -728.350, -731.212, The Permittee needs to describe the water-quality analyses done for the Division of Drinking Water, and report to the Division of Oil, Gas and Mining all water-quality analyses results for the mine-discharge water, including analyses done in compliance with the requirements of the Division of Drinking Water.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Mine Workings Maps

Figure 7P-1 (page 7P-3) shows floor elevations for the #1 Mine; the water level anticipated when drainage to the West Mains begins; and locations of the roof-fall, abandoned equipment, the main inflows to the mine, and the seals and drains. Updated Plate 7-10B shows the location of the roof-fall and abandoned equipment but does not show the mine floor elevations and anticipated water level.

Certification Requirements

The updated Plate 7-10B has not been P.E. certified by Mr. Charles Reynolds.

Findings:

Maps, plans, and cross sections of mining operations are not adequate to meet the minimum regulatory requirements.